

## DESCRIPTION

## COMMUNICATIONS SYSTEM

5        The present invention relates to methods and apparatuses for delivering data to a user and, in particular, to systems where such data is selected from a larger store automatically and on the basis of a compiled profile of the user.

10      An example of such a system is described in European patent application EP-A-0 944 002 which provides a communications method and a communications network comprising a server and a plurality of user terminals. The user terminals can share information with each other and with the server by means of an interconnecting network, especially the Internet. On the server, a profile database is provided containing data representing a 15 characteristic behaviour of associated user addresses. The server automatically acquires this representative data in response to activities performed by the associated users of the network, which data is stored with the associated user addresses in the profile database on the server.

20      The particular concern with the system of EP-A-0 944 002 is to avoid an incorrect or inappropriate profile specification being built up for a user and, to this end, the described profile database can be accessed by the user at any time such that the user can modify the content of the database in relation to the contents associated with one of the addresses associated with that user. The user can modify the contents by, for example, adding, deleting, or 25 amending subject matter in the profile database.

Whilst user profiling can increase the user-friendliness of the system as perceived by the user, the accommodations required in terms of additional data channels to storage and data collation utilities within the server may make the provision of user-profiling or user tailoring of services an unjustified excess.

It is accordingly an object of the present invention to provide some means whereby the user-perceived enhanced system functionality arising from user profiling does not require excessive system communications resources.

According to a first aspect of the present invention, there is provided a networked communications apparatus comprising at least one server and a plurality of user stations, wherein the user stations comprise terminals arranged to receive information from the at least one server by means of a connection via a first network, the apparatus further comprising:

storage means holding a profile database, which profile database contains data representing a characteristic behaviour of an associated user terminal network address or addresses, the apparatus including means for automatically acquiring such data in response to an activity of the associated user and storing the same together with the associated user terminal network address or addresses in the profile database;

wherein the user station further comprises a portable communications device coupled with said terminal and connectable to said at least one server via a second network, wherein the user terminal is configured to perform the automatic acquisition of data for the profile database, said data being transferred to said server via said portable communications device following establishment of a connection via said second network. By use of the portable communications device link for the transfer of user profiling data, traffic on the first network (which may be the Internet or some more localised Intranet) is kept to within manageable levels such that the user does not associate advanced profiling functionality with system delays.

The portable communications device may suitably comprise a mobile telephone (the second network being a telecommunications network), and the said access data for establishing a connection may therefore comprise a telephone number. The above-referenced first network may be the Internet and the user terminals may accordingly comprise at least a display device coupled with processing means hosting an Internet browser and user-operable means for control of the same. With such an arrangement, one or more of the

said terminals may comprise a television receiver further configured to access and display data from the World Wide Web.

In one embodiment, the coupling between the portable communications device and the respective user terminal may comprise a wireless link.

5 Additionally, the aforementioned data transfer via said wireless link preferably follows a predetermined set of message transfer protocols, such as those known generically as "Bluetooth".

The portable communications device may further comprise a buffer arranged to store data received from said server and addressed to the 10 respective user terminal and, in such circumstances, may further comprise means for reading stored data from said buffer and sending said data on to the user terminal. In such an arrangement, the portable communications device may further comprise means configured to determine whether a respective user terminal is available to receive data from the said server and, if so, to forward such data and, if not, to buffer such data until such time as either the 15 respective user terminal becomes available or the buffer becomes full.

In an arrangement as aforesaid, said portable communications device may further comprise means configured to determine whether said server is available to receive data from a respective user terminal and, if so, to forward such data and, if not, to buffer such data until such time as either the server 20 becomes available or the buffer becomes full.

The coupling of said user terminal and said mobile communications device may be by wireless transmission therefrom, and the portable communications device means for receiving wireless transmissions from the 25 terminal may be further configured to receive additional data transmitted wirelessly from other sources.

Also in accordance with the present invention, there is provided a portable communications apparatus for use in a system as described hereinabove, a data processing apparatus having the technical features of a 30 user terminal as recited above and including means for coupling, for transfer of data, with a communications apparatus described above.

According to a further aspect of the present invention, there is provided a method of data communication for use in a networked communications system comprising at least one server and a plurality of user stations, wherein the user stations comprise terminals which can receive information from the at least one server by means of a connection via a first network, the method comprising:

providing a profile database, which profile database contains data representing a characteristic behaviour of an associated user terminal network address or addresses, the data being acquired automatically in response to an activity of the associated user and being stored together with the associated user terminal network address or addresses in the profile database;

with the user station further comprising a portable communications device coupled with said terminal and connectable to said at least one server via a second network, the user terminal performs the automatic acquisition of data for the profile database, said data being transferred to said server via said portable communications device following establishment of a connection via said second network.

The said communications device may comprise a mobile telephone and the server may store access data for establishing connection in the form of a simple telephone number for said mobile telephone. Under such circumstances, the portable communications device may be configured to store data received from said server and addressed to the respective user terminal, and the buffer may hold or buffer such data until such time as either the respective user terminal becomes available or the buffer becomes full.

Further features and advantages of the present invention will become apparent from reading of the following description of preferred embodiments, given by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 represents a coupled arrangement of user terminal and portable communications device;

Figure 2 represents an exemplary implementation of messaging beacon infrastructure;

Figure 3 represents a message format for transmission in a beacon slot in the arrangement of Figure 2;

5 Figure 4 shows the transmission of messaging slots from a beacon to a mobile device; and

Figure 5 represents a combined user terminal and portable communications device and its connection to different services.

10 Figure 1 schematically represents components embodying the present invention and in the form of a networked communications apparatus comprising at least one server or service provider 10 coupled to a plurality of user stations 12 (only one of which is shown) via a link 14 which may comprise a network connection, wireless or cable link, or other data transfer means. The 15 server 10 includes at least one storage means 16 holding a profile database, which profile database contains data representing a characteristic behaviour of an associated user as identified by their terminal network address or addresses. The server builds up the user profile data by automatically acquiring such data in response to one or several selected activities of the 20 associated user, such as what television channels they watch, what goods they purchase on-line and so forth. This profiling data is then stored together with the associated user terminal network address or addresses in the profile database.

The user station further comprises a portable communications device 25 18, suitably a mobile telephone, coupled with said terminal 12 as indicated by dashed link 20. As schematically illustrated, the device 18 includes a receiver 18.R configured to the form of coupling with terminal 12, as well as a buffer 18.A for received signals. The device 18 is connectable to said at least one server or service provider 22 via a second network or data link 24, in this case 30 a telecommunications network. As shown by line 26, the means for automatically acquiring user data (server 10) is coupled to the telecommunications service 22 and may use this channel via link 20 as a

simple low-cost route for user profiling data being gathered from or by the user terminal 12 or as a back channel for other data required to be sent by said terminal 12 back to server 10. In order to facilitate this connection, the service provider 10 need simply store the users mobile telephone number with the 5 profiling data for that user in the profile database 16. By use of the portable communications device link for the transfer of user profiling data, traffic on the first network or link 14 is kept to within manageable levels such that the user does not associate advanced profiling functionality with system delays.

The link 20 between the portable communications device 18 and the 10 respective user terminal 12 may comprise a wireless (radio frequency or infrared) link. Additionally, the aforementioned data transfer via said wireless link preferably follows a predetermined set of message transfer protocols, such as those known generically as "Bluetooth". The support for link 18 further enables interaction with a beacon infrastructure where a system of beacons transmit 15 additional data messages to a users portable communications device 18. The beacons provide matrix coverage over a series of locales.

Whilst base stations or beacons will typically be independent of one another (in a shopping mall set up, each shop provides and maintains its own beacon without reference to any beacons provided by neighbouring shops), 20 the beacons may be wholly or partially networked with at least some co-ordination as to their broadcast messages. Figure 2 is a diagram of such a system 32 of linked beacons embodying the invention and providing an implementation of an infrastructure for use in, for example, department stores, shopping malls, theme parks, etc. The system 32 comprises a plurality of beacons B1, B2, B3, BN distributed over a series of locales. Each of the beacons B1-BN broadcasts one or more short-range inquiry signals in a time-slot format. The beacons B1 - BN are controlled by a beacon infrastructure server (BIS) 40, with one or more terminals T1, T2, T3, TM being connected to the server 40. The terminals T1 - TM enable service providers, i.e., the users 25 of beacons B1 - BN, to author or edit allocated service slots in the form of added data piggy backed on inquiry facilitation signals transmitted by beacons B1 - BN. A service provider may lease a beacon or one of the beacon's service 30

slots from the infrastructure provider. To this end, server 40 provides simple HTML templates for filling out by the user via one of terminals T1 - TM. Having filled out the template with, for example, a description of the service and other information for the data to be carried via the beacon broadcast, the template is 5 returned to server 40, preferably via a secure link using, e.g., Secure HTTP (S-HTTP) or Secure Sockets Layer (SSL). SSL creates a secure link between a client and a server, over which any amount of data can be sent securely. S-HTTP is designed to transmit individual messages securely. Server 40 then creates the appropriate additional data package FI for appending to the inquiry 10 signal of a relevant one of the beacons B1 - BN based on the information submitted with the template. The system 32 may further comprise a beacon website hosted by an application server 34 to assist in carrying out various functions, as will be readily understood by the skilled reader.

Whilst it is expected that the messages will simply be broadcast to 15 whichever mobile devices 18 are within range of a given terminal (with the user then being able to view the message data on the mobile device), response messages sent by the mobile device back to the broadcasting beacon may be supported, as indicated by dashed line 30. In one preferred embodiment, the mobile device 18 is provided with a buffer (18.A) to build up a log of received 20 messages (optionally time-stamping them on receipt – for which purpose a clock signal source 17 may be provided) which messages can then be studied, perhaps edited on the mobile by use of the device keys, and replied to – for example if containing URL's - at the users leisure. With the buffer, the viewing and responding of messages may be handled by other devices of the user with 25 the captured log being downloaded (e.g. via link 20) when the user is back in the vicinity of these devices.

Services may rent beacon slots from an infrastructure provider, and a typical message form, shown in Figure 3, might comprise:

30	id	an identifier for the transmitting beacon
	SS	an identifier for the Service Supplier
	Ci	specification of the Service Class
	SD	(optionally) further service details

QoS specification of Quality of Service  
pi one or more connection pointers.

The connection pointers pi may be prefixed by a pointer type (eg.SMS, 5 1-800 #,url). One service may have alternative pointers for the mobile to activate the service connection. Various qualities of service QoS may be supported by the same service provider, e.g. SMS, Audio interaction, GPRS, WAP etc. These should also be matched against the users preferences, mobile platform options, and cost preferences.

10 As represented by Figure 4, each beacon 50 emits, in pulsed mode, a frame 52 of barcode slots offering connection "bridges" i.e. data enabling or supporting connection to various local services. The frame 52 is received by mobile device 18 with a connection pointer pi being used to initiate a service from service provider 54: the service may comprise a telecommunications or 15 web-based service or some other arrangement for information delivery dependent on the capabilities of the mobile device 18. Prior to service activation by service provider 54 with a selected quality of service QoS, a negotiation or comparison process occurs between the stored user profile SUP (held in storage at 56) and characteristics of the service class as specified by 20 Ci to optimise the selection of service class and QoS. The chosen QoS should fit the user's context, and acceptable charging rate. Therefore different QoS specifications may have different priorities at different times of the user's day.

Before using pointer pi to activate the service connection si from provider 54 (which may be made over GSM cellnet, SMS, or even over the 25 wireless link 20, optionally following bluetooth protocols) the class Ci (and possibly further details, e.g. QoS) is compared with current subset of the user profile, SUP. The physical location for storage 56 holding the SUP may be on the mobile (e.g. as a table), or remotely on a web site owned by the user, or provided by the beacon infrastructure provider for end users. The first stages 30 of correlating class Ci and further service details against the SUP are preferably automatic. These may happen even before the user is notified by the mobile of the presence of a link to that service.

If a service of class Ci matches a table of classes held on the mobile device 18, then in a first option the user is alerted and may with a single key press on the mobile 18 activate the service pointer pi. In an alternative arrangement, the mobile 18 first automatically issues (e.g. via SMS) a request to remote beacon website BS hosted by application server 34 for a more exact correlation between the services details (as held in local storage 58 by application server 34) and the stored SUP. If the service is deemed to match the user's current interest and intent, a positive answer is returned to the mobile 18 and only then is the user alerted by the mobile of the service's presence. The user then has the choice to activate the service automatically via its pointer pi being sent to service provider 54.

Figure 5 represents a further arrangement for TV or music-linked services, with an entertainment system ES 70 (TV, CD Player, MP3 jukebox or games platform for examples) being coupled via the mobile device 18 to the service provider 54 hosting, for example, Cellnet or web-based services.

As before, the frame broadcast by wireless link to the mobile may contain more than one service class, more than one pointer type pi per service offering different QoS and optionally more details of the services on offer.

In an extreme example, a service slot might only contain the identity of a music CD currently being played, plus a pointer pi (e.g. to a phone-based music service or web site) being pre-stored on the mobile. On activating the service via pi, the service is passed the identity of the CD from the beacon slot information, and the music service can be automatically tailored to the current CD.

Although defined principally in terms of a software-based or controlled implementation, the skilled reader will be well aware than many of the above-described functional features could equally well be implemented in hardware or a combination of software and hardware.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other

features which are already known in the design, manufacture and use of telecommunications systems and/or data network access apparatus and devices and component parts thereof and which may be used instead of or in addition to features already described herein.